

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Withdrawn) A telephone with an IACK keypad defining both combination key regions and independent key regions arranged in alternating columns, wherein columns of combination key regions include

multiple numerical columns together including numerical regions corresponding to numerals 0 through 9, with each numerical column containing a plurality of said numerical regions, and

at least one other column containing key regions corresponding to punctuation symbols.

2. (Withdrawn) The telephone of claim 1 with three numerical columns.

3. (Withdrawn) The telephone of claim 2 wherein the numerical columns together form a standard telephone key layout, with a left numerical column containing 1,4,7, a middle numerical column containing 2,5,8,0, and a right numerical column containing 3,6,9.

4. (Withdrawn) The telephone of claim 1 wherein the key regions are defined by corresponding sensible features on an exposed surface of a flexible membrane.

5. (Withdrawn) The telephone of claim 4 wherein the sensible features comprise changes in elevation across the surface of the membrane.

6. (Withdrawn) The telephone of claim 5 wherein the independent key regions are spaced apart with a spacing of no more than about one-half of a human finger tip width.

7. (Withdrawn) The telephone of claim 1 wherein the numerical key regions are visibly larger than the key regions corresponding to punctuation symbols.

8. (Withdrawn) The telephone of claim 1 wherein the independent key regions and the combination key regions are of different size.

9. (Withdrawn) The telephone of claim 1 wherein the independent key regions together include regions corresponding to letters of an alphabet.

10. (Withdrawn) The telephone of claim 1 wherein each key region carries an associated, visible legend.

11. (Withdrawn) The telephone of claim 1 wherein the numerical columns have a visibly different coloration than said one other column.

12. (Withdrawn) The telephone of claim 1 wherein the combination key regions are arranged in columns of alternating width.

13. (Withdrawn) The telephone of claim 1 wherein the independent key regions are arranged in six vertical columns, as determined by key legend orientation.

14. (Withdrawn) The telephone of claim 13 wherein the independent key regions are arranged in first, third, fifth, seventh, ninth and eleventh vertical columns and comprise regions corresponding to letters, the numerical combination key region columns forming second, sixth and tenth vertical columns, and fourth and eighth vertical columns including key regions

corresponding to punctuation symbols, with column numbering progressing from either lateral side of the keypad.

15. (Withdrawn) The telephone of claim 1 configured to register different punctuation symbols as one of the key regions corresponding to punctuation symbols is actuated twice in succession.

16. (Withdrawn) An IACK keypad comprising a cover with an exposed surface defining both combination key regions and independent key regions arranged in alternating columns, with the independent key regions comprising nubs elevated above the combination key regions, the exposed surface forming a continuous, smooth contour between adjacent independent key regions, void of delineations marking shared boundaries between adjacent independent key grid spaces of an underlying key space grid.

17. (Withdrawn) The IACK keypad of claim 16 wherein the nubs are diamond-shaped, with corners directed between adjacent combination key regions.

18. (Withdrawn) The IACK keypad of claim 16 wherein the continuous, smooth contour between adjacent independent key regions carries visible legends corresponding to the combination key regions.

19. (Withdrawn) An IACK keypad defining both combination key regions and independent key regions arranged in alternating columns and having a standard orientation defined by legends associated with the independent and combination key regions, wherein the alternating columns are disposed along lines canted at an angle with respect to the standard orientation of the keypad.

20. (Withdrawn) The IACK keypad of claim 19 wherein said angle is about 45 degrees.

21. (Currently Amended) A touch-sensitive input device comprising an exposed, continuous surface defining a planar area; and a grid of sense elements coextensive with the area of the exposed surface and responsive to engagement of the exposed surface by an operator to establish a position of said engagement on the exposed surface, wherein the exposed surface varies in elevation across its planar area to form a series of tactile features, and wherein the exposed, continuous surface is permanently affixed to the grid of sense elements to form an integrated assembly.

22. (Original) The input device of claim 21 wherein the tactile features comprise elevated nubs.

23. (Original) The input device of claim 22 wherein said elevated nubs extend at least about 0.75 millimeter from adjacent regions of the exposed surface.

24. (Original) The input device of claim 22 wherein said surface carries legends associated with said tactile features.

25. (Original) The input device of claim 21 wherein said tactile features define distinct regions of the surface corresponding with associated alphanumeric characters.

26. (Original) The input device of claim 25 configured to output a sequence of alphanumeric characters as corresponding tactile features of the surface are engaged sequentially.

27. (Original) The input device of claim 21 comprising an IACK keypad.

28. (Original) The input device of claim 27 wherein the tactile features comprise nubs defining independent key regions of the IACK keypad.

29. (Original) The input device of claim 27, further comprising an electronic circuit adapted to temporarily display alphanumeric characters on a screen as an operator traverses the exposed surface, the displayed alphanumeric characters selected to correspond to a position of engagement of the exposed surface by the operator.

30. (Withdrawn) An electronic device comprising an IACK keypad having an exposed, continuous surface defining both independent key regions and combination key regions;

a grid of sense elements underlying the surface of the keypad and responsive to motion of a human finger across the surface of the keypad; and

an electronic circuit adapted to receive signals from the IACK keypad indicative of keypad status and to produce an output in response to keypad actuation by an operator;

wherein the electronic circuit is configured to determine an intended combination key input based at least in part upon a sensed position of a finger between centers of adjacent independent key regions.

31. (Withdrawn) The electronic device of claim 30, further comprising a key switch matrix responsive to engagement of independent key regions, wherein the electronic circuit is configured to determine intended combination key input based on both the sensed finger position and a state of the key switch matrix.

32. (Withdrawn) The electronic device of claim 31, wherein the grid of sense elements and the key switch matrix share some conductive traces of a printed circuit board.

33. (Withdrawn) The electronic device of claim 30 wherein the grid of sense elements defines a grid spacing wider than a spacing between centers of adjacent independent key regions.

34. (Original) An electronic device comprising
a substrate carrying a first array of spaced apart, conductive trace elements;
a flexible cover disposed above the substrate and carrying a second array of spaced apart, conductive trace elements, said first and second arrays together forming a coordinate system, the cover separated from the substrate by an array of resilient, collapsible elements and having an exposed, continuous surface;
the first and second arrays of trace elements forming a capacitive grid responsive to presence of a digit of an operator on the surface of the cover; and
an electronic circuit adapted to sense a capacitive state of the grid and to determine a position of said digit upon the sensed capacitive state.

35. (Original) The electronic device of claim 34 wherein said continuous surface defines key regions of a keypad; and wherein said electronic circuit interprets an intended keypad input based at least in part upon the sensed capacitive state.

36. (Original) The electronic device of claim 34 wherein the capacitive grid is responsive to a position of local deflection of the cover toward the substrate.

37. (Original) The electronic device of claim 34 wherein the second array of trace elements is disposed on a surface of the cover closest the substrate.

38. (Original) The electronic device of claim 34 in the form of an IACK keypad, with the exposed cover surface defining both independent key regions and combination key regions.

39. (Original) The electronic device of claim 34 wherein the collapsible elements comprise formations integrally molded to extend from a surface of the cover facing the substrate.

40. (Withdrawn) A keypad comprising an outer cover with an exposed, continuous surface defining key regions; a grid of sense elements underlying the surface of the cover and responsive to position of a human finger on the surface of the keypad; and a single switch adapted to change state when any one of a multiplicity of the key regions is pressed.

41. (Withdrawn) The keypad of claim 40 wherein the single switch is adapted to change state when any key region of the keypad is depressed.

42. (Withdrawn) The keypad of claim 40 in the form of an IACK keypad, with the exposed cover surface defining both independent key regions and combination key regions, the single switch adapted to change state when any independent key region is depressed.

43. (Withdrawn) The keypad of claim 42 wherein the independent key regions are elevated above the combination key regions.

44. (Withdrawn) A telephone comprising a keypad defining alpha key regions corresponding to individual letters, and numerical key regions corresponding to individual numerals; and an electronic circuit connected to the keypad to receive input therefrom as various key regions are engaged by an operator; wherein the electronic circuit is configured to translate alpha key input into numerical output in the form of a combination of numerals 2 through 9, based upon standard telephone keypad letter-number correspondence.

45. (Withdrawn) The telephone of claim 44 wherein the electronic circuit is configured to, in a first mode, display an individual letter in response to engagement of a selected alpha key region, and to, in a second mode, display one of numerals 2 through 9 in response to engagement of the selected alpha key region, the displayed numeral selected according to standard telephone keypad letter-number correspondence.

46. (Withdrawn) The telephone of claim 44 wherein the electronic circuit is configured to register a sequence of letters as their associated alpha key regions are engaged; and, in response to additional input from the operator, transpose the registered sequence of letters into a telephone number according to standard telephone keypad letter-number correspondence.

47. (Withdrawn) The telephone of claim 46 wherein the electronic circuit is further adapted to, in response to said additional input, initiate a telephone call using the telephone number.

48. (Withdrawn) The telephone of claim 44 wherein the electronic circuit is adapted to register numerical output according to the numerals associated with the numerical key regions.

49. (Withdrawn) A method of dialing a telephone, the method comprising entering a desired sequence of alphanumeric characters including at least one alpha character, the telephone generating a corresponding sequence of numerals by transposing the alpha character into one of the numerals 2 through 9 according to standard telephone keypad letter-number correspondence.

50. (Withdrawn) The method of claim 49 further including instructing the telephone to generate the corresponding sequence of numerals after the alphanumeric sequence has been entered.

51. (Withdrawn) The method of claim 49 wherein the desired sequence of alphanumeric characters is entered on a keypad including at least 24 individual key regions, each key region corresponding to a different alphabet letter.

52. (Withdrawn) The method of claim 49 wherein the desired sequence of alphanumeric characters is in the form of a pronounceable utterance and entered by pronouncing the utterance.

53. (Withdrawn) The method of claim 49 wherein the sequence of alphanumeric characters includes a series of alpha characters.

54. (Withdrawn) The method of claim 53 wherein the series of alpha characters spells a pronounceable text.

55. (Currently Amended) A keypad comprising
a substrate carrying an array of sense elements arranged to change state in response to keypad operation;

a flexible cover disposed above the substrate and having an exposed surface defining an array of elevated key regions, with non-elevated key regions defined in interstices between adjacent elevated key regions; and

an array of discrete snap elements extending between the cover and the substrate and spacing the cover from the substrate, the snap elements each located between two adjacent elevated key regions and adapted to resiliently collapse as a non-linear response to local pressure

against the exposed cover surface to provide tactile feedback of keypad operation in response to pressure against both elevated key regions and non-elevated key regions.

56. (Previously Presented) The keypad of claim 55 wherein the snap elements are located under the non-elevated key regions.

57. (Previously Presented) The keypad of claim 55 wherein the snap elements are located between directly adjacent elevated key regions.

58. (Previously Presented) The keypad of claim 55 wherein the snap elements include snap elements located under the non-elevated key regions and snap elements located directly between directly adjacent elevated key regions.

59. (Previously Presented) The keypad of claim 55 wherein each elevated key region and each non-elevated key region has four corresponding, spaced-apart snap elements disposed at its periphery, with each interstice between four adjacent snap elements corresponding to a key region.

60. (Previously Presented) The keypad of claim 59 wherein the snap elements are each located equidistant between centers of adjacent elevated key regions and equidistant between centers of adjacent non-elevated key regions.

61. (Previously Presented) The keypad of claim 60 wherein each elevated key region defines an exposed contact pressure area, the keypad further comprising an array of conductive pills between the substrate and cover, each conductive pill centered below a corresponding elevated key region and extending laterally farther than the contact pressure area of its associated elevated key region.

62. (Previously Presented) The keypad of claim 61 wherein each conductive pill extends laterally farther toward an adjacent non-elevated key region than the contact pressure area of its associated elevated key region.

63. (Previously Presented) The keypad of claim 61 wherein the elevated key regions are of diamond shape, with arms directed between adjacent non-elevated key regions.

64. (Previously Presented) The keypad of claim 59 wherein each pair of adjacent elevated key regions has three of said snap elements disposed along a line segment disposed midway between the pair of elevated key regions.

65. (Previously Presented) The keypad of claim 64 wherein the three snap elements are equally spaced along the line segment, with one directly between centers of the elevated key regions of the pair, and one at either end of the line segment, at an interstice between four adjacent elevated key regions.

66. (Previously Presented) The keypad of claim 55 wherein the snap elements are of elastomer integrally molded with and extending from a back surface of the cover.

67. (Previously Presented) The keypad of claim 55 wherein the snap elements are molded of silicone.

68. (Previously Presented) The keypad of claim 55 wherein the snap elements are frustoconical shape.

69. (Previously Presented) The keypad of claim 55 wherein the snap elements are arranged to provide a substantially equal tactile feedback in response to activating both elevated key regions and non-elevated key regions.

70. (Previously Presented) The keypad of claim 55 wherein the snap elements are constructed and arranged to require a substantially equal normal activation force for both elevated key regions and non-elevated key regions.

71. (Currently Amended) A[[n]] keypad comprising a substrate carrying an array of sense elements arranged to change state in response to keypad operation; a flexible cover disposed above the substrate and having an exposed surface defining an array of elevated key regions, with non-elevated key regions defined in interstices between adjacent elevated key regions; and an array of discrete snap elements extending between the cover and the substrate and spacing the cover from the substrate, the snap elements each located between two adjacent elevated key regions and adapted to resiliently collapse toward the substrate as a non-linear response to local pressure against the exposed cover surface to provide tactile feedback of keypad operation, the snap element each being symmetric in shape about an associated axis perpendicular to the substrate and intersecting the cover between adjacent elevated key regions, wherein the snap elements are arranged to provide a substantially equal tactile feedback in response to pressure against both elevated and non-elevated key regions.

72. (Previously Presented) The keypad of claim 71 wherein the snap elements are frustoconical in shape.

73. (Previously Presented) The keypad of claim 71 wherein each elevated key region has at least four corresponding, spaced-apart snap elements disposed at its periphery, with each interstice between four adjacent snap elements corresponding to a key region.

74. (Previously Presented) The keypad of claim 71 wherein the snap elements are of elastomer integrally molded with and extending from a back surface of the cover.

75. (Canceled)

76. (Previously Presented) A keypad comprising a substantially planar substrate carrying an array of sense elements arranged to change state in response to keypad operation; a flexible cover disposed above the substrate and having an exposed surface defining an array of key regions arranged in rows, the key regions comprising alternating rows of elevated and non-elevated key regions, with at least some non-elevated key regions disposed between four adjacent elevated key regions; and at least one continuous, elongated snap element extending adjacent at least three key regions of one row of elevated key regions, between the cover and the substrate and spacing the cover from the substrate, the snap element adapted to resiliently collapse as a non-linear response to local pressure against the exposed cover surface to provide tactile feedback of keypad operation.

77. (Previously Presented) The keypad of claim 76 comprising multiple snap elements in the form of elongated rails extending between adjacent rows of key regions.

78. (Previously Presented) The keypad of claim 76 wherein the snap element comprises a rib extending at an angle with respect to the plane of the substrate and configured to buckle in response to local pressure against the exposed cover surface.

79. (Previously Presented) The keypad of claim 78 wherein the angle is about 60 degrees.

80. (Currently Amended) A keypad comprising

a substantially planar substrate carrying an array of sense elements arranged to change state in response to keypad operation; and

a flexible cover disposed above the substrate and having

an exposed surface defining an array of ~~independent~~ elevated key regions arranged in rows and columns, with non-elevated key regions between adjacent elevated key regions, and

a back surface facing the substrate and held away from the substrate by collapsible snap elements therebetween, the back surface carrying an array of conductive pills located beneath corresponding elevated key regions;

wherein each conductive pill has a contact surface facing the substrate, the contact surface having outer regions that slope away from the substrate.

81. (Previously Presented) The keypad of claim 80 wherein the conductive pills are cross-shaped, with arms extending toward multiple adjacent non-elevated key regions, the arms of the conductive pills comprising the sloping outer regions.

82. (Currently Amended) The keypad of claim 80 wherein each conductive pill extends across the back surface of the substrate cover toward an adjacent non-elevated key region center a lateral distance equal to between about 40 percent and 99 percent of a distance between the adjacent non-elevated key region center and a center of the elevated key region corresponding to the pill.

83. (Currently Amended) The keypad of claim 82 wherein each conductive pill extends across the back surface of the substrate cover toward an adjacent non-elevated key region center a lateral distance equal to between about 50 percent and 90 percent of a distance between the adjacent non-elevated key region center and a center of the elevated key region corresponding to the pill.

84. (Currently Amended) The keypad of claim 83 wherein each conductive pill extends across the back surface of the substrate cover toward an adjacent non-elevated key region center a lateral distance equal to between about 70 percent and 80 percent of a distance between the adjacent non-elevated key region center and a center of the elevated key region corresponding to the pill.

85. (Withdrawn) A method of interpreting IACK keypad input, the method comprising

sensing keypad input corresponding to a combined actuation of a plurality of independent key regions of the keypad;

comparing the sensed input to defined sets of independent key inputs corresponding to combination keys;

for sensed inputs found to correspond to a plurality of independent key regions associated with a combination key, registering a combination key input; and,

for sensed inputs found not to correspond to any combination key, comparing the sensed input to recorded custom chorded key associations; and,

for sensed inputs found to correspond to a recorded custom chorded key association, registering a sequence of characters according to the corresponding chorded key association.

86-90. (Cancelled).

91. (Previously Presented) The keypad of claim 55 wherein the sense elements are arranged beneath corresponding elevated key regions.

92. (Previously Presented) The keypad of claim 91 wherein the non-elevated key regions are disposed between adjacent sense elements, such that an input corresponding to any of the non-elevated key regions is determined as a function of actuation of sense elements adjacent that non-elevated key region.

93. (Previously Presented) The keypad of claim 80 wherein the sense elements are arranged beneath corresponding elevated key regions.

94. (Previously Presented) The keypad of claim 93 wherein the non-elevated key regions are disposed between adjacent sense elements, such that an input corresponding to any of the non-elevated key regions is determined as a function of actuation of sense elements adjacent to that non-elevated key region.